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Hydrosedimentological study of a covered fluviokarst in the Brazilian Cerrado

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The studied region located in the Rio Vermelho watershed, situated at the foot of the *Serra Geral de Goiás* in the Brazilian Cerrado, hosts a covered fluviokarst system containing ~150 mapped caves that capture the rivers (sediment loads) upstream. The present study aims at developing a better understanding of the geomorphological controls, considering the impacts of climatic conditions and land use types on the production and transport of the sediments to the caves using an integrated approach (GIS mapping, hydrosedimentological monitoring, and geochronological analysis).

The preliminary results indicate the influence of two sites on sediment production: a) downstream, constituted by the karstic system developed in the Neoproterozoic carbonates (Bambuú group), where the soils are occupied by natural vegetation or pastures (family farming), and, b) upstream, on a plateau, which supplies water to the karstic system, with soils developed on Cretaceous sandstones (Urucuia group), the areas of growing mechanized agriculture. Models of the upper and lower fluviokarst systems are developed using the soil types and recharge zonation information. The chronology of the preserved sedimentary deposits, formed by the alternation of clayey and sandy facies, has been established, between 60ky and 200ky in the upper cavities and up to 20 ky in the fluviokarst blind valleys. Hydrosedimentological monitoring revealed the production of ~ 9 Mg ha⁻¹yr⁻¹ of sediments from degraded soils, while 2.0 Mg ha⁻¹yr⁻¹ are produced from soils having received the conservation protocol, a lower value than the geological rate as established in the literature. The sediments transported in the karst are poorly sorted compared to those in the rivers and an increase in the particulate load during floods (<7 against ~500 mg/L).

There is still a lack of evidence about the origin of the water and sediments circulating in this karst system. Further studies on fresh sedimentary deposits in the recent sinkholes may help to better quantify recent paleo-environmental modifications and the effects of anthropogenic activities upstream.

Keywords: GIS; Geochronology; Blind valleys; C14; Fluviokarst